REMARKS

Upon entry of the above-amended claims, claims 1-33, 38, 39, 58-67, and 75-80 will remain pending. Claims 24-33, 39, 62-67, and 75-78 are allowed. Claims 7-21, 59, 61, 79 and 80 are objected to.

In view of the above amendments and the following remarks, reconsideration and allowance of the present application are respectfully requested.

I. The Rejection Under Section 112, First Paragraph.

In the outstanding Office Action, claims 1-6, 22, 23, 38, 58, and 60 are rejected under 35 U.S.C. §112, first paragraph, as containing subject matter which is not described in the Specification in such a way as to reasonably convey to one of ordinary skill in the art that the inventors, at the time the application was filed, had possession of the claimed invention. These claims do not recite a collector element, and the Examiner asserts that the specification and drawings do not support the claimed invention without the collector element, and that "the collector element is considered essential in achieving an improved detection of a vended article . . . [i]t is not understood how the objectives of the invention could be attained without the collector element."

A. Sections of the Specification of Note.

First, Applicants will address the above statement in quotes, set forth by the Examiner in the Office Action . Applicants note that there are different aspects of the invention which correspond to different objects set forth in the Specification. However, none of the objects set forth in the Summary of the Invention require the use of a collector element. (See, Specification, page 6). One object, for example, is to provide an optical vend-sensing system, which detects an object that has actually been vended. (See, Specification, page 6, lines 2-3). Another object is to provide an optical vend-sensing system, which detects vended objects having various sizes and shapes. (See, Specification, page 6, lines 4-5). For example, as disclosed in the Specification, a vended article tumbles through a vend space and the vend space is wide in order to accommodate different size products. (See, Specification, page 3, line 21 through page 4, line 4, and at page 4, lines 12-16).

In order to accomplish these objects, by way of example, the specification describes an invention at the paragraph bridging pages 13 and 14. There, the specification states that,

> "[t]he present invention concerns an optical vend-sensing system, the article sensing sub-system of which is arranged athwart the vend space 24 immediately the vend hopper 26, at 30, and a vending or a dispensing machine that has such an optical vend-sensing system."

(Emphasis added).

The Specification also describes other aspects of the invention, which do not require the use of a specific implementation or preferred embodiment, such as a sensor

comprising a collector. For example, the Specification describes, at page 6, lines 17 *et seq.*, that :

> "for ensuring that a vending machine motor will continue to operate until a product has descended through a vending space or an established time interval has elapsed, a continuous optical beam is established across the vend space through which a product must drop."

The Specification goes on to say at the bottom of page 6 that "preferably, the beam is thin for good sensitivity but not so thin that it leads to alignment problems." The Specification further discloses that "in a first embodiment, infra-red light is emitted by a row of emitters, spread into a beam by a diffuser, and is detected by a segmented detector arrangement, including two side-by-side curved mirrored-surface collectors." (Emphasis added).

Note that the first mention of a collector is in connection with a first embodiment, not with the object of the invention or with an aspect of the invention itself.

B. Compliance with Section 112, First Paragraph

The rejection is described in terms of the claims lacking support by the Specification. Specifically, the Examiner is asserting that the patent application fails to meet the Written Description requirements. As set forth in MPEP §2163.02, the relevant inquiry for determining compliance with the Written Description requirement is whether "the description clearly allows persons of ordinary skill in the art to recognize that he or she invented what is claimed. (MPEP Section 2163.02, first paragraph). The subject matter

of the claim need not be described literally in order for the disclosure to satisfy the description requirement."(MPEP Section 2163.02, second paragraph).

The present application reasonably conveys to the artisan that the inventor had possession of an invention corresponding to an optical vend-sensing system for control of a vending machine, where the sensing system comprises an emitter.

Moreover, the above-quoted portions of the specification provide direct support for the provision of an article sensing sub-system which is arranged athwart of a vend space; i.e., the optical sensor covers, blocks or spans the vend space.

*1. **Blocking or Spanning the Vend Space with the Optical Sensor.***

The specific embodiments go on to describe various types of optical vend-sensing systems, which happen to comprise detector arrangements that use collectors. These features are merely preferred and thus cannot be considered critical or "essential" as referred to by the Examiner. See, for example, MPEP §2164.08(c), where the Patent Office states "features which are merely preferred are not to be considered critical." (Citing *in re Goffee* 542, F.2d 564, 567, 191 USPQ 429, 431 (CCPA 1976).)

The MPEP further states that:

> "Limiting an applicant to the preferred materials in the absence of limiting prior art would not serve the constitutional purpose of promoting the progress in the useful arts. Therefore, an enablement rejection based on the grounds that a disclosed critical limitation is missing from a claim should be made only when the language of the specification makes it clear that the limitation is critical for the invention to function as intended. Broad language in the

> disclosure, including the abstract, omitting an allegedly critical feature, tends to rebut the argument of criticality."

One of ordinary skill in the art would recognize that a feature of the invention which allows the object of the invention set forth at page 6, lines 2-5, to be achieved, requires that the optical sensor provides radiation that spans, covers, or thwarts the vend space.

2. A Conventional/Known Approach to Creating Radiation That Blocks or Spans a Given Area Involves the Use of a Bank of Emitters and a Bank of Detectors, without a Collector.

Embodiments are disclosed which use a bank of emitters for emitting light at one side of the vend space. A collector is used to gather the light at the receive side of the vend space, and provide such collected light to one or more detectors. It is well known in the art to provide a bank of emitters at one end of a space to be sensed, and a bank of corresponding detectors at the other end of the space. This is evidenced by select pages of the sensor catalogs, provided herewith. For example, the attached sections of the Aromat product catalog, dated 1996, clearly discloses a high-reliability wide coverage optical sensor. (See, Aromat catalog, page 147). The sensor comprises a receiver having a bank of detectors and an emitter, which has a corresponding bank of emitters. The pitch, i.e., the distance between the beams emitted by the respective emitters, can be controlled depending upon the application so that objects of various sizes will be detected by the sensor. Furthermore, the attached sections of the Sunx product catalog, also dated 1996, clearly discloses sensors having similar detector and emitter configurations. (See, Sunx catalog, pages 28 –29).

Given such evidence of conventional, off-the-shelf products, it is clear that one of ordinary skill in the art would know that a sensor having broad plane radiation that spans (or thwarts) a vend space can be implemented with one of the preferred embodiments, or can be achieved using more conventional, off-the-shelf, technology. The Specification describes the invention in such terms, not limited to a use of a collector element. (Specification, pages 6, 13).

C. Conclusion.

For at least the reasons mentioned above, Applicants submit that each of the claims in the present application is fully supported by the specification, and accordingly request the Examiner to withdraw the rejection under 35 U.S.C. §112, first paragraph.

II. The Rejection Under Sections 102 and 103.

Claims 1, 38 and 58 have been rejected under 35 U.S.C. §102(b) as being clearly anticipated by MOULDING Jr., et al. (U.S. Patent No. 4,869,392). Claim 60 has been rejected under 35 U.S.C. §103(a) as being unpatentable over MOULDING Jr., et al. Of those claims rejected, claims 1 and 58 are independent. Applicants note that the MOULDING Jr., et al. patent is directed to a pill dispensing apparatus. The objects being detected are uniform in size and shape and are not free falling. Rather, the objects are retained by an escapement device while being detected. The area where the object is retained is very close in size to the objects so that the object cannot vary its position beyond a very limited range.

The independent claims, i.e., claims 1 and 58, each recite the use of electromagnetic radiation in a beam that defines a transverse cross-sectional plane of the vend space.

Applicants' representative contacted the Examiner by phone to try to obtain a better understanding of the Examiner's interpretation of the MOULDING Jr., et al. reference. Based upon those telephone discussions, it is our understanding that the Examiner has interpreted each of claims 1 and 58 to cover a system where only a portion of a vend space is covered by a sensor. To address this interpretation issue, the Examiner and Applicants' representative worked out modifications to the independent claims which would make it clear that the transverse cross-section of the vend space extends across the lateral width and the front-to-rear depth of the vend space. With this clarification, the MOULDING Jr., et al. apparatus fails to meet the limitations of either of independent claims 1 and 58. There is no suggestion or teaching in any reference of record which would, in a proper combination, remedy that deficiency in the MOULDING Jr., et al. patent. Accordingly, Applicants submit that each of claims 1, 38 and 58 is patentable under 35 U.S.C. §102 and §103. In view of the foregoing, reconsideration and allowance of the present application are respectfully requested. A notice to that effect is earnestly solicited.

Should the Examiner have any questions or believe that issues may be further clarified so as to expedite the prosecution of this application, the Examiner is requested to contact the undersigned at the below-listed telephone number.

APPENDIX SHOWING MARKED-UP VERSION OF CLAIMS 1 AND 58

1. (Three Times Amended) An optical vend-sensing system for control of a vending machine which has at least one mechanism arranged for initiating operation upon selection by a customer for vending an article into a vend space through which the article falls into a customer-accessible hopper, the vend space having a defined lateral width and a defined front-to-rear depth, said vend-sensing system comprising:

[said] an article sensing [system] subsystem arranged athwart said vend space, said article sensing subsystem comprising:

at least one emitter of electromagnetic radiation, and associated emitting structure, arranged [at one lateral extreme of said vend space] to emit electromagnetic radiation in a broad plane which substantially completely covers the transverse cross section of the vend space, the transverse cross section extending across the lateral width and across the front-to-rear depth of the vend space and being below said at least one mechanism but above where said article, upon being vended, comes to rest in said customer-accessible hopper[;] and comprising at least one electromagnetic radiation detector and associated detection structure;

a machine control unit arranged [for terminating] to terminate operation of the respective at least one mechanism; and

control circuitry operatively connecting said [at least one detector] article sensing subsystem with said machine control unit, and arranged [for providing a signal for causing] to cause the machine control unit to complete a vend [cycle] operation procedure

of said [respective] at least one mechanism upon said [at least one detector] article sensing subsystem sensing that electromagnetic radiation, reaching said at least one detector and associate detection structure as a result of electromagnetic radiation emission by said at least one emitter and associated emitting structure, has temporarily diminished by a predetermined amount.

58. (Three times amended) An optical vend-sensing system for control of a vending machine which has at least one mechanism arranged for initiating operation upon selection by a customer for vending an article into a vend space through which the article falls into a customer-accessible hopper, the vend space having a defined lateral width and a defined front-to-rear depth, said vend-sensing system comprising:

[said] an article sensing [system] subsystem arranged athwart said vend space, said article sensing subsystem comprising:

an emitter of electromagnetic radiation and associated emitting structure arranged [at one lateral extreme of said vend space] to emit electromagnetic radiation [in a beam which strikes] and an electromagnetic radiation detector and associated detection structure arranged [at one lateral extreme of said vend space] to receive the electromagnetic radiation, said [beam defining] electromagnetic radiation substantially completely covering a transverse cross sectional plane of the vend space the transverse cross sectional plane extending across the lateral width and across the front-to-rear depth of the vend space and being below said at least one mechanism but above where said article, upon being vended, comes to rest in said customer-accessible hopper;

a machine control unit arranged [for terminating] to terminate operation of the respective at least one mechanism; and

control circuitry operatively connecting said [at least one detector] article sensing subsystem with said machine control unit, and arranged [for providing a signal for causing] to cause the machine control unit to complete a vend [cycle] operation procedure of said respective at least one mechanism upon said [at least one detector] article sensing subsystem sensing that electromagnetic radiation, reaching said at least one detector and associated detection structure as a result of electromagnetic radiation emission by said at least one emitter and associated emitting structure have [has] temporarily diminished by a predetermined amount.

Respectfully submitted,

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